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OXEN AND BUFFALOES.

[DICTIONARY OF ECONOMIC PRODUCTS, Vol. V., O. 551-94.]

THE CATTLE AND BUFFALOES OF BURMA.

Note by VETERINARY CAPTAIN G. H. EVANS, A.V.D., Superintendent, Civil Veterinary Department.

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E. C. BUCK,
Secretary to the Government of India.

(*Veterinary Series, No. 11.*)

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THE CATTLE AND BUFFALOES OF BURMA.

Note by VETERINARY CAPTAIN G. H. EVANS, A.V.D., Superintendent, Civil Veterinary Department.

GENERAL REMARKS.—Burmese cattle belong to the species zebu or humped cattle, but the type is peculiar and indigenous to Burma, the adjoining Shan States, and, I believe, Siam. One great feature in the character of the Burmese as a nation is their affection for and kindness to all dumb creatures; this is partly the result of their religious training and ideas, but is also in a great measure due to an inherent love of animals. Europeans, who have served in India, on visiting Burma are at once struck with the cattle and ponies, their fine condition promptly attracting attention; and, taking the cattle all round, they give evidence of the care so obviously bestowed on them. They are not very large, but sturdy, well-set, fine-boned creatures, very docile, making good draught cattle, and for their inches possess great powers of endurance. The most important objects for which cattle are used are, to provide motive power to the cultivators for agricultural purposes, and, to enable Burmese, Siamese, and Chinese Shans, to carry on a large and extensive caravan trade; the cattle are accordingly valued for their strength and activity. The people, though meat-eaters, are forbidden by their religion to destroy life, and so much is this religious ordinance observed in the districts that if owners of cattle become aware that dealers are purchasing animals for purposes of slaughter they will refuse to sell even when offered fairly remunerative prices. The price of beef is accordingly very high in Rangoon; aged and worn out animals have to be procured at high prices to meet the demand. The people being a pleasure-seeking nation, it is not surprising to find that cart-racing is a popular pastime in many parts of the province. The bullocks used for this purpose are lighter built, more muscular, and receive a certain amount of hand-feeding. Animals with any reputation for racing command high and fancy prices. Racing carts are made very light, weighing between 60 and 80 lbs, and are built after the fashion of American trotting carts. The races are usually matches. Two carts are taken to the starting point, each being on a

Good condition of Burmese cattle.

Uses.

Racing carts

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OXEN**The Cattle and**

A racing
match.

separate track, which is about 3 or 4 furlongs in length. The drivers, who are very skilful, either sit on the seat of the cart or astride the pole. The animals at a given signal start off at a full gallop and are urged on by the voice, touching the animal on the rump with the hands or a cane. Sharp sticks and goads are rarely used, and tail-twisting is not much in vogue. Owners take great pride in the appearance of their animals, in fact, of the whole turn-out; and on feast days the carts look most picturesque; rows of bells sewn on to spangled cloth are suspended on the front of the chests of the bullocks, with a surcingle of similar material round the girth. The headgear consists of a kind of cloth head collar with bells and pieces of looking-glass sewn into it, whilst at times a peacock or pheasant done in spangled work is placed between the horns and on the surcingle behind the hump. Again, some animals are covered with a highly gaudy cloth of Mandalay fancy work.

Securing
bullocks.

The ordinary method for securing a bullock is to put a rope through the cartilage between the nasal orifices, and to pass it along the cheek and tie it behind the horns. The operation is performed in the following manner:—

A rope is tied round the animal's neck, after which he is brought up and secured short to a post. To keep the head steady, a piece of string is passed round the muzzle a few times, the free ends being also tied round the post. A sharp wooden skewer, provided with an eye, into which a string is inserted, is now pushed through the cartilage, and after the rope is tied behind the horns the animal is let go. The wound heals in from 10 to 14 days. The operation is usually performed between the ages of three and four.

Reins for driving consist of a single cotton rope of various colours which is attached to the head rope on each bullock behind the horns. This gives the driver almost complete control over his animal.

Age.—Cattle are aged by the state of their teeth, and at times by the rings on the horns.

MANAGEMENT.

How worked.

If it can possibly be avoided, cattle are not called upon to work during the heat of the day. Travelling all night or in the early morning is preferred for the sake of the cattle; however, during the ploughing season cultivators exact a great deal of work from their oxen; they are careful not to over-do it, the work being necessarily severe, owing to the heaviness of the paddy land. When halting after a march, the animals are unyoked, the neck is then well shampooed and rubbed down (a business all Burmans are good at, being their usual treatment for most ills that flesh is heir to), after which the animals are watered and given some straw. The cart-man now sits down, and proceeds to chop up a quantity of maize and paddy straw. This is mixed with a little oil-cake and given to the animals. If space admits, the carts are formed round and the cattle put inside. This being finished, the men begin to look about for themselves. During the rice season, when the paddy is coming up, cattle have very often to be tied up at all times, in which case owners have to go out and cut grass for them. Others send their cattle out in charge of some person to graze in the jungle, failing which they are driven on to the "Kazins," or paddy bunds, which are wider than those seen in Southern India. Many people, when the ploughing season is over, send their cattle to distant grazing grounds in charge of professional herdsmen, who make a fairly good living out of this occupation, as their remuneration varies from 2 to 5 baskets of paddy per head for the season. After reaping they are brought back to cart the grain to the nearest

How fed.

Buffaloes of Burma. (G. H. Evans.) AND BUFFALOES.

threshing floor and to assist in treading the grain out of the ear. At this season the cattle are permitted to roam where they like, straw being in abundance, as in this country most part of the culm is left standing. Speaking generally, it may be said that cattle receive a very small amount of hand-feeding. Oil-cake, when cheap and procurable, is given, and in Upper Burma chopped maize and *jowari* stalk are largely used to augment the ordinary fodder. During the months of March, April and part of May, vegetation is at its lowest, but, with the exception of a few districts, in the dry zone there is usually an ample supply of fodder to carry them through. It is during these months that grass on the extensive plains of Pegu, etc., is burned, and with the help of a few showers, which usually occur about this time, the young grass springs up, providing fodder for thousands of cattle. As soon as the rains set in, the pasturage becomes rich and luxuriant, villagers usually endeavouring to keep a piece of (waste) land for pasture, but now-a-days in many parts this is seriously encroached upon owing to the rapid extension of cultivation. Cultivators appear to be realising the benefit to be obtained by stacking straw to augment the food-supply during the dry season. This year stacks seem to be very numerous, many of them being well-made and erected on bamboo and wooden platforms; however, even now, tons of valuable straw are annually wasted, i.e., allowed to rot in the fields or set on fire.

Cattle-food.

WATER-SUPPLY.

During the dry season, there is in some places a dearth of water, animals suffering a good deal at this period. In parts, where shallow streams are handy, a bund is run across to hold the water; in others watering from wells is carried out. On large plains, and in the vicinity of tidal creeks, it is customary to construct tanks. There is no doubt that the germs of disease are often sown at this time, the water near tidal creeks is brackish, and that contained in the stagnant pools is most offensive and as thick as pea-soup.

Defective water-supply.

INSECT PESTS.

Cattle are at certain seasons subjected to much annoyance from the bites of insects, etc. Mosquitoes and Sand-flies (the Burmese name of which are *Chin* and *Pynt*) give great trouble, and large smouldering fires have to be kept burning to drive them away. In some stations it is not an uncommon thing to find ponies kept under curtains. The Gad-Fly, (Burmese *Hmet*), nearly drive cattle mad. There are at least two kinds of *Muscidae*. We have here a little Ox-fly, they cause probably more annoyance to cattle by their numbers than by their bites, though they can perform the latter operation very well. There are a number of species of Ticks, (Burmese *Hmwa*), which usually fix themselves about the groin, scrotum, udder, etc.; causing at times nasty sores when forcibly removed.

Insect-pests.

Dic. Eeon.
Prod.,
P. 483.

Other pests are Leeches flourishing chiefly during the early part of the rains, there are at least two kinds which attack cattle, known in Burma as *Kyat* or land-leech, and the other *Hmyaw* or water-leech, they attack the animals when drinking and attach themselves to the legs, and abdomen, they sometimes creep into the nostrils causing great pain and suffering. I have seen as many as eight large water-leeches, distended to bursting point on the abdomen of a single buffalo. Two methods are employed to cause these creatures to release their hold, one is the application of a mixture of lime and tobacco juice, the other being to place a Burmese cheroot '*Hselete*' (which is not

Leeches.

OXEN**The Cattle and**

Snake-bite.
*Dic. Econ.
Prod., M.
233; P. 134.*

unlike a small torch) near their skins; both these methods readily having the desired effect.

Death from Snake-bite is not at all infrequent, the following more common kinds of poisonous snakes no doubt account for many of the deaths, *viz.*, the Cobra Naja, *Myway-houk*, Russels Viper, Daboia, *Myway-bway*.

Two kinds of sea-snakes inhabit the creeks, they are very venomous and are known as *Kyatlon*, and *Kyat-Pya*.

The *Bungarus faciatus*, *Gnan-Dau-Kya*, and the *Bungarus Caeruleus*. *Gnan-Gwet*, these are both "Kraits."

DUNG.

Use of dung.
*Dic. Econ.
Prod., M.
233; P. 134.*

Cowdung is not used for such a variety of purposes as it is in India. In fact, it may be said to be little used, except by Chinese gardeners, who buy up a good deal to manure their fruit and kitchen gardens. Burmans also apply manure to betel and sugarcane plantations, and in some part of the province the cultivators sprinkle it over their fields. The people rarely use it as fuel for cooking purposes, but potters sometimes add cowdung to the wood-fuel when baking pots. It is also burned in the vicinity of cattle pens, etc., to drive off mosquitoes and other insect pests, which are at times most trying. Manure is cheap enough, and can be bought for 8 annas a cart-load, but may very often be had for the asking.

THE HOUSING OF CATTLE.

Housing of cattle.

In inundated villages.

Cattle are usually driven to the villages at night-fall. Some of the animals are housed under the dwellings of the villagers, where there is ample room, the huts being erected on piles. Other animals are tethered in a simple shed. The common method, however, is to pen them. The ordinary pen is a square-shaped enclosure, the fence consisting of uprights of natural "Y" shaped forks of trees, the sides being formed of round logs in the rough resting on these uprights, sometimes of two or three, one on top of the other. Many of the wealthier owners have a shed within or attached to the enclosures to protect their animals from the weather, the roof consisting of scantlings, bamboos, and thatched with "*Thatka*," ordinary elephant grass. In other cases cattle are kept in large wastelands which exist in many parts of the province, but even then temporary enclosures of bamboos or thorny bushes are erected. On the frontiers of Upper Burma, where villages are stockaded, the cattle are kept at night between the first and second enclosures. In certain parts of the Delta, where, owing to the rising of the rivers, the surrounding country becomes inundated for miles, precautionary measures are taken to avoid losses from this source, large and small sheds, erected on high posts, are kept in readiness, and on the first indications of a rise, the cattle are hustled in somehow. They often have to remain penned up for at least three, often four, months, till the waters subside. Fodder is brought in boats, etc., from a great distance. It is a comical sight to see the village cattle perched up in these sheds. Villages near the banks are almost submerged, only the upper story being visible; there is often ten to twelve feet of water in the streets. At times some of the cattle are kept out on a piece of rising ground, some little distance from the river bank, but a sudden and high rise frequently leaves hardly standing room for the unfortunate beasts. Under such circumstances if there should be another portion of dry land fairly adjacent, the owners drive the cattle into the water, and with the assistance of men in canoes, get them on to it. The mortality from cattle diseases in such cases, is too terrible, and there are no means of doing anything that can save them.

Buffaloes of Burma. (G. H. Evans.) AND BUFFALOES

HIDES.

Chinamen usually deal in hides; the rates vary all over the province. Price of a cow hide usually runs from Rs.8 in the outlying parts to Rs.8 to Rs.60 per 100 viss. The Chinese are most industrious, they seem to have a use for every thing, a number of them drive a large and lucrative business by buying up that portion of the legs of cattle below the knees and hocks. I visited one of the establishments carrying on this trade, and noticed a number of gunny bags ready filled and labelled with Chinese hieroglyphics, and on enquiry as to their contents was informed, that one contained hoofs, another shank-bones, a third pedal-bones, etc., etc., and that they were ready for shipment to China. As the legs come into the factory the men strip the skin off, the pieces are then laid out to dry, after which they are put up in small bundles, and sewn up in gunny bags. I understood that some were buried, to be converted into manure, which is applied to certain gardens, where it is intended to grow a particular kind of pumpkin, the remainder are roughly tanned and are used to make sandals. The tendons are next removed, thoroughly cleaned, and are then suspended from string or bamboo trellis work, to dry, they are afterwards collected, put up into small bundles containing a certain number in each. Most of these undergo some process in China whereby they are converted into a fine and esteemed delicacy which, it is said, adds a relish to pork, the remainder being boiled down for gelatine. The shank bones are nicely cleaned and dried, as also the remaining small bones, each bone is thrown into a separate bag sewn up and labelled, from these are made handles for small knives, ear-rings, and little buttons. The hoof from each digit is thrown into separate bags; these are of course boiled down for glue.

SHOEING.

Cattle usually run unshod, excepting where there is much traffic on metallised roads. The operation is performed by Natives of India, and is carried out in the same way as in India.

PRICE.

The prices of course vary considerably; an ordinary pair of working oxen may be bought from Rs.120 to Rs.150, but well matched and superior animals will fetch as much as Rs.300. Cows sell for from Rs.30 to Rs.60 each, and half-bred cows from Rs.80 to Rs.110, according to their milking powers. In the Shan States bullocks may be bought slightly cheaper.

SHAN CARAVANS.

During the cold weather months a very large caravan trade in pickled tea, tobacco, etc., is carried on between the Shan States and Burma by the Panthis and Shans, the former employing mules and the latter bullocks; as many as two hundred bullocks may be seen in a caravan. The stages vary between 10 and 13 miles, but are often more. These animals are excellent climbers, march independently of each other, and are capable of maintaining a very fair pace for a good number of marches; as a rule, each man has charge of five animals. The marches are usually done in the early morning, and when there is a good road at night. On arrival in camp, the animals are immediately relieved of their loads, just rubbed down, taken to water, and then allowed to graze all day under the charge

Prices of
hides.Chinese use
of the legs.Use of leg-
bones.

Shoeing.

Price of
cattle.Shan
caravans.

OXEN**The Cattle and****Shan
caravans.**

of some of the men. The saddles are then exposed to the sun for some time, and are afterwards shaken up to prevent them from getting lumpy. To avoid mixing, each animal's saddle and load are then carefully arranged round the camp after the fashion of a zareba. When the bullocks return in the evening they are kept inside this enclosure, and are tied to the loads or picketed along-side. Generally speaking, galls may be said to be rather the exception than the rule, and footsore cattle are not common. A certain percentage run spare to replace casualties. The average load carried by each animal is from 158 to 160 lbs.

The saddle.**THE SADDLE.**

The saddle consists of two pillows or cushions, each about 24" x 19" which are generally stuffed with silk cotton, but sometimes plain paddy husk is employed for the purpose. These pillows rest on the back of the animal and are kept together with a rope, which passes from rather high up behind the cushions to about the centre of them in front, where a knot is tied. Resting diagonally across each cushion is a thin flat piece of wood, in shape somewhat like the sole of a boot. These are kept in position by the abovementioned rope which passes over them, and two strings which pass over the top of the saddle and connect them. The idea being to relieve the pressure from the basket. At the upper and posterior end of the cushions is a piece of hide which is doubled over towards the front of the saddle and is secured with string. The object of this is to prevent the double piece of matting or hide, which is placed over the cushions, from working back. The appliance used for carrying the load consists of two long deep baskets, which are kept together by a pole which runs through loops in the baskets and which, for further security, is also tied with string. A second piece of rounded wood is inserted between the baskets at the top to give a wider hold on the back and make the load steadier. From the inner and posterior edge of each basket there is a piece of rope about 10 inches long which passes backwards, each end being tied to a semi-circular piece of wood. No girth is employed with this gear, the pads and matting having been laid on the back of the animal. The baskets are lifted on to the pad and the load is secured in the following simple manner : in front there is a broad neck-strap, usually made of plaited strings or hide ; this passes from one basket round the animal's neck to the other, where it is tied ; behind there is a crupper which consists of a semi-circular piece of wood with a piece of rope coming from each end which passes under and around the tail (the tail-piece has a loop attached to the end through which the tail itself is drawn). On each string are a number of brass or wooden balls to prevent galling ; and to complete the loading the two semi-circular pieces of wood are lashed together with strings or hide. For all ordinary purposes of transport, these caravan bullocks are very handy indeed, the great advantage being that they are easily obtained, little or no rations need be carried for them as fodder is usually abundant. They are cheap and, generally speaking, give little or no trouble. Commissariat stores can, with very little inconvenience, be carried in the baskets, a usual load being about 120 lbs. The Shans trading from the north often employ the Panthè saddle (Chinese) with their cattle ; it is quite different to the above. The tree of the saddle consists of two arches, front and rear, connected by two bars, one above, the other below, the panels are made up of thin arched boards which are adjusted with rivets to the under surface of the tree, the top of each arch is oblong in shape with a slit in the middle for the attachment of straps. The gear is made of green hide, there is a neck strap which passes from the top of the front arch round the neck, to meet a strap and buckle.

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coming from the near side of arch. The crupper consists of a dock-piece which is a hollow semi-circular piece of wood, through which is passed a piece of string ; between the saddle and the dock-piece on each string are placed a number of balls to prevent chafing, the free ends of the string are attached to the rear arch of the saddle. The connecting bars of the tree together with the sides of the arches form a rest or cradle on which the stand or crutch rides. This crutch is the appliance to which the load or baskets are secured, it is simply an arched frame, to the top of which are tied two pairs of thongs, these are for lashing the load to the stand ; the load should never touch the ground. Large oblong baskets are employed for carrying purposes. The great advantage of this stand is, that it can be lifted on and off the saddle, without disturbing the load, thus saving much time and labour. The saddle is usually made out of pine wood which is light and durable. For the protection of the back, two pads are used, the lower resting on the back is simply a pillow well filled with paddy husk, the upper one is not so thick and is also sometimes filled with paddy husk, but is more frequently made out of bark or fibre sewn in cloth, these pads are secured to the front and rear arches by thongs through the centre space of the saddle. No girths are used with this saddle. It differs only in a few details from that employed with the Chinese Mules.

The saddle.

There are several objections to bullocks being employed on active service—

- (1) they are rather slow;
- (2) require good time to graze ;
- (3) delays in calling in the animals and men getting their food ;
- (4) they are easily stampeded ;
- (5) owing to the animals marching independently and straggling, etc., a large escort would have to be provided ; on the other hand, they might perhaps be employed with advantage on the main lines of communications.

OXEN.

I. BURMAN.

Head.—The head is shapely and well carried, and is fairly broad between the eyes. The forehead is slightly concave and the muzzle full and broad.

Horns.—The horns are invariably very small, averaging from 4 to 6 inches in length. This stunted appearance is due to a peculiar custom of cutting down the horns under the impression that it imparts a youthful appearance. The methods employed in removing them are as follows :—

1. The horns are sawn off close to the horn core with a common saw, after which the ends are pared and made shapely with a “dah” (knife).

2. In the Tharrawaddy District I was informed that the operation is also performed by friction with a bit of “*hnee*” (green strip of bamboo). It having been decided at what point the horns are to be removed, a piece of string is tied above and below to mark it off. The “*hnee*” is then placed between and worked rapidly to and fro until the horn is divided. The age at which this operation is carried out is usually between three and four years, sometimes later. Where there has been no interference, as is frequently the case with some Shan cattle, the horns attain a length of 16 inches. They are sprung well apart and take an upward and forward direction.

Ears.—Neat, small, standing more or less erect : the colour of the hair within is of a lighter tint than that covering the body.

Description
of Burman
oxen.Dic Econ.
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OXEN	The Cattle and
Description of Burman oxen.	<i>Eyes</i> .—Lively and full, with a mild expression, black in colour, and shaded by fairly long lashes. <i>Muzzle</i> .—Black in colour.
	<i>Neck</i> .—As a rule, the neck is short, powerful and moderately heavy. This, of course, is influenced by the age at which castration is performed. <i>Dewlap</i> .—Compared with Indian cattle, the dewlap is very small indeed. It extends from the chin to the sternum, the latter usually being broad and prominent. <i>Hump</i> .—At the shoulder the back line is broken by the hump; this masculine appendage is not nearly so well developed as in many Indian breeds. In the Burman bull it rises to a height of 6 or 7 inches, in bullocks between 4 and $5\frac{1}{2}$ inches, and is only slightly marked in cows. <i>Back Line</i> .—Straight from the shoulder to the loins, where there is a gentle rise; the croup droops to a certain extent, and the pelvis may be described as narrow; the loins and back are wide and level, showing considerable power. <i>Tail</i> .—The tail is nicely formed, tapering like a whip thong, and is provided with a very long tuft of hair. It is set on a little below the line of the back, but does not look ugly. <i>Shoulders</i> .—Well sloped, lying well back over the ribs. Height behind hump 46 to 51 inches. <i>Forelegs</i> .—Short, shapely, with a good forearm, ranging from 14 to 17 inches in circumference. The joints are large; there is ample bone under the knee: average measurement $6\frac{1}{2}$ to 7 inches. <i>Chest</i> .—Wide and deep, possessing good girth; average measurement about 63 to 70 inches. <i>Ribs</i> .—Broad, well sprung and deep, the barrel is rounded and substantial, the measurement usually exceeding that of the girth by 10 or 12 inches. <i>Hindlegs</i> .—Hind quarters are fairly well packed, and the thighs are thick and muscular, showing strength. <i>The Sheath</i> .—This is a very remarkable point about the Burman ox as compared with Indian cattle. It is exceedingly small and close. The orifice is furnished with a tuft of long hair. <i>Feet</i> .—These are in proportion to the size of the body. They are hard, well-shaped, and usually black or dark brown in colour. <i>Skin</i> .—The majority of cattle have dark skins, they are fairly thick, loose, and well covered with hair. <i>Temper</i> .—As a rule, very mild in disposition. Even bulls are most tolerant towards Europeans and strangers. After experience of Indian cattle one is amazed at the remarkable absence of vice amongst these creatures. It is no doubt due to the kindness shown to them by the people. <i>Voice</i> .—This is an extraordinary grunt very difficult to describe. It is something between a cough and a guttural grunt. There is no resemblance to the loud bellow of home cattle. <i>Colour</i> .—The colour of the oxen varies a good deal, but I think red may be accepted as the true colour: it is undoubtedly the most prevalent, though the various shades of straw are common enough. The hair on the dewlap, abdomen, and inside of thighs, is of a much lighter tint than that of the upper parts of the body, but they merge into each other, blending softly and harmoniously. A great many of the cattle have a white patch running down the buttock and extending down the back of the thighs. This point is also common to the indigenous wild cattle. Marbled or broken colours are rare, and are indicative of cross-breeding, and consequently seen more frequently near large towns. In

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the hilly countries, like the Shan and Chin Hills, I think that black becomes the predominating colour, and the higher one goes the darker the animals seem to get. The *Mithuns*, which are domesticated in the Chin Hills, are usually very dark chestnut or black with white stockings.

Castration.—In this country castration is usually resorted to when animals have attained maturity, that is, between four and five years of age. To carry out this operation one of three methods is usually adopted:—

1. The animal having been cast and securely tied with ropes, the neck of the scrotum is grasped with the hand, and the testicles are given a few sharp blows with a flat smooth piece of wood (a portion of the branch of a palm is often employed for this purpose) to thoroughly bruise them; after which the animal is untied and allowed to go.

2. This is a slight modification of the above; a piece of split bamboo is employed as a clamp to grasp the neck of the scrotum. The testicles are then bruised and kneaded into a pulp with the hands. When this is sufficiently done, the clamp is removed and the animal is allowed to rise.

3. *Excision.*—This, the most surgical method, is performed by opening the scrotum with a knife; the spermatic artery is ligatured, and the testicles cut off. This operation, however, is not much resorted to. A certain amount of inflammation necessarily follows these operations. The only medicine employed to allay it is a mixture of gingelly oil (*Sesamum indicum*) and turmeric. In some parts soot is added. This mixture is simply smeared over the swollen scrotum. The same mixture is also used in the Shan States. The operation of crushing the testicle, though rude and unscientific, is very free from evil results and when it is taken into consideration what might happen to animals, going about with open wounds, I think it may be pronounced to be the more humane system. Some cultivators and cattle-owners employ professional operators to carry out the castration of their live-stock, and as remuneration for their trouble receive a fee of one rupee, or four annas with one "pye," i.e., $\frac{1}{8}$ part of a basket of rice, or about 3*lb* for every operation. The people entertain strong and decided opinions on the prejudicial effects of early castration. So well do they know this, that they can with a fair degree of nicety tell when to carry out the operation with the least possible evil results. The effects of early castration are a general weakening of the frame, the animal becomes leggy, and the neck does not attain its natural size. The colour, instead of becoming rich on approaching maturity, remains light. Though in many instances the generative sexual impulse may not be entirely obliterated, yet the operation is sufficiently complete to effectually render the animal useless for breeding purposes. The operation is usually carried out between the ages of three and five years. When delayed too long, it renders the animal listless and lazy, the result being that he becomes too fat to make a good working ox.

Castration.

2. BURMAN COWS.

With certain slight modification the description of the oxen applies to the cows. The general points of difference are—

- (a) the head is smaller and finer;
- (b) the horns are very small and are often irregular;
- (c) the neck is light; both hump and dewlap very small;
- (d) udder and teats remarkably so.

Description
of Burman
cows.

In short, they are altogether smaller in stature, of lighter build, and weigh considerably less. These differences may be accounted for in

OXEN**The Cattle and****Milk and
butter
supply.**

several ways, the most important being the early age that cows are bred from, which cannot but have a prejudicial effect on their growth and development. Moreover, they go on breeding year after year till quite worn out. Cows do not meet with anything like the amount of attention bestowed on the male stock, seldom receiving any hand-feeding, and their calves are permitted to suck till the mother rejects them; milk and its products do not constitute an article of diet with the Burmans. This, to a great extent, accounts for the wretchedly poor milking quality of these animals. In large towns, with an European community, the monopoly of the milk supply is entirely in the hands of the Natives of India, who import milch cattle from Calcutta and Madras; some of them give a fair quantity of milk in addition to bringing up a calf. Milkmen practise hand-feeding their cows. There is ample room for a larger milk supply in this country, as in Rangoon the price of milk is about five quart bottles per rupee, and fresh butter is unknown. Cross-bred cows are sought after as they are better milkers than the indigenous animals, and there is no doubt that, if properly selected, cross-bred cattle will in time give a good yield of milk.

**Burman
bulls.**

Burmans do not specially set aside any of their bulls for breeding purposes. They castrate them when they arrive at maturity; cattle are not kept isolated, and very frequently a number of villages have only a common pasture for all; the animals mix, and the young herd-bulls of course become the stock getters. Under the above condition, it would be difficult to introduce a system of breeding from selected sires. To make it successful, one of two courses would have to be adopted:—(a) either to separate all bulls and graze them apart or (b) to castrate all stock at an early age; this, I fear, would not commend itself to the people. There are a few imported bulls about the big towns, whose services may, in some cases, be had gratis; in others a charge of Rs 2 is made. A few cross-bred bulls are also kept; these animals are usually in the hands of milkmen. Burman bulls are never branded.

Shan cattle.

4. SHAN CATTLE.
Shan cattle—so-called because bred in or brought from the adjoining Shan States. There are no marked distinguishing features between them and the low country cattle: the Burmans say the Shans are slightly smaller, but when a few Shan and Burmese cattle are mixed and a stranger is asked to separate them, he is at a loss.

Indian cattle.

5. INDIAN CATTLE.
For dairy purposes, large numbers of Calcutta or Madras cows are imported: the greater number of these animals remain in close proximity to the large towns, though a few may now and again be seen in the interior. Some small Indian bullocks work in draught in and round about Rangoon; they come from Madras. The people do not fancy the Indian cattle very much as they are impatient, not so quiet nor so easily handled as their own animals; however, they are more showy, and perhaps on this score are used in carts at funerals, pagoda festivals, etc.; but as a matter of fact, for agricultural work generally, the people prefer their own cattle as they say they can stand heat better and are most enduring and capable of a vast amount more work.

Half-breeds.

6. HALF BREEDS.
The common half-bred is a cross between an Indian bull and an indigenous cow; the differences are well marked. The half-bred usually is a

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much larger animal. The hump is more developed. The horns are generally much longer, the dewlap heavier, extending a long way back and almost joining on to the sheath, which is also quite different, being loose and dependent. In the cow the udder and teats are much larger. The ears are very often larger and droop much more than in the Burman. In temper they are impatient, and not so tolerant towards strangers.

WILD CATTLE.

There are four other varieties of the genus *bos* found in Burma, *viz.* :—

- (1) *Bos gaurus*, “*Pyaung*” or Indian Bison.
- (2) *Bos frontalis*, *Mithun* or *Gayal*.
- (3) *Bos sonaicus*, “*Saing*,” Banting or Burmese wild bull.
- (4) *Bos bubalus*, “*Tau Kyne*” or wild buffalo.

(See *Buffaloes*).

Wild cattle.

1. *Bos gaurus*.

Head.—Somewhat square, short and massive, with a well-defined frontal ridge.

Eyes.—Large and full. Lightish blue-coloured pupils.

Ears.—The ears are like those of the larger kinds of deer.

Neck.—The bull has a very short, heavy and immensely massive neck.

Dorsal Ridge.—The gaur has not got a hump, but the spinous processes of the dorsal vertebrae are enormously developed, and this ridge extends to the middle of the back, where it drops several inches. Owing to this high ridge, the quarters appear to droop very much, but they are plump enough. The tail is short, with a tuft of hair on the end.

Horns.—The horns are slightly flattened on one side. In the bulls they are massive, thick, rugged and frequently worn at the points, and in the aged animals the skin between and around the base of the horns is greatly thickened and cornaceous. The horns in cows are more upright, thinner, and curve inwards more than in the other sex. The colour of the horns is palish green, tipped with black. There is hardly any frontal ridge.

A good bull stands 5 feet 10 inches at the shoulder, cows are much lighter built, and less dark in colour.

Colour.—The prevailing colour of the cow-bison is very dark chestnut or coffee brown. In the old bulls, however, this deepens almost to black. The inside of the forearms and thighs is a bright chestnut, the forehead is a dirty white; the forelegs from above the knees down and the hind legs from just above the hocks are of the same colour. The “*pyaung*” is diffused throughout Burma wherever there is heavy forest and hilly country. They roam about in herds. The gaur has not been domesticated.

The Gaur wild cattle or Indian Bison,

*Dic. Econ.
Prod.*
O. 567.

2. *Bos frontalis* (*MITHUN*).

Head.—The head is very short as compared with that of the bison, and the frontal ridge is less defined. The horns are directed laterally and more or less upwards; they are straight and wide-spreading, and not so massive as in the bison.

The neck is broad and heavy in the bull, and the dewlap is fairly developed, as also the dorsal ridge, which is very well marked and is similar to that of the bison, but not quite so high. The tail is also longer.

Colour same as bison.

The Mithun wild cattle or Gayal.

*Dic. Econ.
Prod.*
O. 568.

OXEN**The Cattle and****The Mithun.**

In the Chin Hills there are numbers of domestic *Mithun*; they are probably captured in raids across the Kaladan, and in the Chittagong Hills, where, I believe, they are easily and extensively domesticated. They are heavy and clumsy enough in appearance. The legs are short and carcasses large. The Chins keep them to kill for meat at feasts, etc. They appear to be very quiet in disposition. These animals are crossed with local cattle.

Bos sondaicus* "SAING."*The Saing
wild cattle.**

*Dic. Econ.
Prod.,
O. 669.*

Head.—The head is well shaped and handsome, length of face is one foot nine inches; breadth across between horns one foot. The colour of the face is greyish white. The frontal ridge is not so marked as in the gaur; the horns resemble those of the gaur, but are thinner and lighter, and weigh less, those of the old bulls are very rugged; in the cow, the horns are slight, take an upward and inward curve and are more or less lyrate in shape. Colour of the horns whitish yellow at the base, shading off to palish green, and black at the tips.

The Eyes.—Full and bright, and pupils lightish blue.

Ears.—These resemble those of the larger deer, the hair within is of a lightish colour.

Muzzle.—Full and black in colour.

Neck.—Medium in length, heavy, and massive girth, at base three feet nine inches.

Dewlap.—Decided, but not heavy.

The Back Line.—There is a decided dorsal-ridge, not so developed as in the gaur; it reaches to about the centre of the back where there is an abrupt fall of some four or five inches. Length from poll to dock, seven feet and one inch.

The tail is long, reaching just below the nocks. It is provided with a good tuft of hair, length 36 inches.

Height.—Good bulls between sixteen hands and sixteen hands two inches.

Ribs.—Broad and well sprung, girth of chest behind the elbows 33 inches, round the abdomen 90.

Shoulders.—Good slope, lying well over the ribs.

Forelegs.—Fine and shapely, with plenty of bone under the knee, girth round forearm 22 inches, girth under knee 7 inches.

Feet.—Large and deer-like, black in colour.

Colour.—Bright chestnut, under surface of abdomen also chestnut, face and dewlap greyish white, from the forearm to just above the knee, the colour is a peculiar blackish grey, from just above the knees and hocks down to the feet, the colour is a dirty greyish white, there is a faint but decided dark stripe running down the centre of the back. The oldest bulls at a very short distance look almost black, the colour is, however, a very dark chestnut, white stockings are common to both sexes, as also white patch on the buttocks, commencing on either side of the tail, and extending down the back of thighs, growing darker as it descends towards the hocks. In the cow bright chestnut is permanent. The cows are also fine beasts; their measurements are less all round.

The measurements given are those taken from an average good herd bull, and a cow.

Note.—In certain parts of the provinces, there are some so-called wild cattle, though very ferocious and, to all intents and purposes, wild, they are simply tame ones that have run wild, they breed amongst themselves, and, no doubt, the bulls cover some of the cows from villages in the jungle, these animals do not differ in appearance from the ordinary cattle; broken colours are not infrequent amongst them.

For description of *Bubalus arni* (*see* Buffaloes).

Buffaloes of Burma. (G. H. Evans.) AND BUFFALOES.

BURMESE BUFFALOES.

1. *Bos Bubalus.*Burmeſe
buffaloes.Dic. Econ.
Prod.
O. 558.*The Head*—Large and massive, and fairly short.*Fore-head*—Rounded.

Horns.—These in both sexes vary much in size, length and curve, but are, as a rule, large and powerful; those of the cow are not so thick, but are frequently longer and straighter than those of the bull. On leaving the skull they project outwards, backwards, upwards, and inwards, in fact they may be described as crescent-shaped. When the nose is raised, the horns slope back, and lie along the sides of the neck and shoulders. The upper and under surfaces are flat. On the upper surface there is a series of rings, giving the horns a rugged appearance, and are supposed to be indicative of age. The upper margins are thick and the lower ones thin.

The Ears—Fairly small.*Eyes*—Large and dark.*Muzzle*—Black.*Neck*—Short, massive, and very powerful in the bull.

Back Line.—This is invariably more or less irregular; there is a considerable rise in the region of the shoulders and again in the Lumbo-sacral region.

Croup drops in a very marked manner, and the tail is set on very low, and is fairly short.

Shoulders.—Well-formed and well-placed over the forward ribs; height at shoulder usually varies from 51 to 56 inches.

Forelegs.—Short, thick and powerful; the joints are large. Measurement round fore-arm from 17 to 20 inches, and under knee from 8½ to 10 inches. There is also a tuft of longish hair on knees.

Chest.—Large and deep with very good girth; round region of heart measurement from 76 to 84 inches.

Ribs.—The body is massive: ribs are round and large; the barrel measurement exceeds that of the girth by about a foot.

Hind quarters.—Short, drooping, not well packed; thigh fair; this is about the worst point of the buffaloes.

Sheath.—This is very small, and is slightly pendulous, the end very much resembling a teat in shape.

Srotum is fairly small and usually pink in colour, as also are the udders and teats of the female.

Feet—Large, broad and flat.

Skin—Dark and thick with a thin coat of hair, which is usually long, wiry and black in colour.

Voice.—Usually a mild plaintive squeak.

Temper.—When in the hands of their owners they are extremely gentle and tractable, but are easily alarmed by any unusual object. The sight of an European is invariably calculated to evoke an alarming display of hostility from these creatures. This is considerably augmented, should he happen to be wearing a large hat or if on horseback. Ponies are most distasteful to them; however, if tended by a little child he can usually restrain them from doing damage, and when visiting grounds frequented by these animals, it is as well either to be well armed or to take out a small child with a switch to drive them off, if they are inclined to be nasty.

Colour.—Black, there are two white lines on the body, one extending from the base of one ear passing under the throat to that of the other, and second line which runs from the point of one shoulder under the neck to

OXEN**The Cattle and****Burmese buffaloes.**

the other. These lines are very plain in the calf as the skin is flesh coloured, and the hair is almost white. These lines, however, become very dark as the animal advances in age, but are rarely, if ever, obliterated. The legs from the knees to the hocks downwards are of a greyish white colour. So also are the under-surface of the abdomen and inside of thighs. Broken colours are unknown. Albinoe are not uncommon. Calves have a good coat of light colour.

Castration.—Buffaloes are castrated on arriving at maturity. The operation is performed in a similar manner to that described for cattle. It is, as a rule, carried out between the ages of 4 and 6 years and between the months of November and February.

Bulls.—Bulls are not selected for breeding purposes.

She-buffaloes differ from the other sex only in not being so massive. The head, horns, neck, etc., are much lighter, and the measurements all round considerably less. The udder, teats, etc., are small. These animals begin to breed when they are about three years old, and drop a calf annually for some years. Calves are dropped at all times of the year and are not weaned, but the mothers very often run dry before the birth of another calf.

Milking.—Buffaloes in this Province give very little milk indeed, from $\frac{1}{2}$ to 2 viss is about the utmost yield. It is sold at from 5 annas to 10 annas per viss.

2. OTHER BREEDS.

A good many Indian buffaloes are found in and around Rangoon imported principally from Calcutta.

3. WILD BUFFALOES.***Bubalus arni.*****Wild buffaloes.**

*Dir. Econ.
Prod.
U. 655*

In some of the delta districts there are a good number of wild buffaloes. These are said to be indigenous, and, though they are wild enough now, it is not improbable that they are tame buffaloes which have escaped and run wild. These animals are certainly much more massive, higher at the shoulder, etc., than tame ones. The forehead is more convex, and the horns are large and massive. They are easily provoked, and when aroused are most ferocious, and will frequently attack human beings even when unprovoked. These animals roam about in herds, varying in number from 10 to 20. The bulls, however, often lead a solitary life and are most dangerous. During the day these creatures retire to the swamps and dense marshy jungles. The village buffaloes, when driven out to graze at certain times of the year, not unfrequently mix with the wild ones. The Burman herdsman can readily recognize an intruder, as it is said that tame buffaloes, even when very plump, never attain the same size as their wilder brethren. Now and again a wild bull makes his appearance in a tame herd, and, speedily ingratiating himself with the cows, takes command of it. The cross between the wild and the tame buffaloes is a fine animal; he is very massive, stands higher, has longer and stouter horns, and is not so quiet as the tame one.

Prices of hides vary according to the locality. They usually sell for R60 to R90 per hundred viss. Very large single hides sell from R5 to R7 each. Buffalo horns are sold for R60 to R90 per hundred viss.

General remarks.—Buffaloes are naturally most plentiful in the delta and coast district, where the atmosphere is moist, the rainfall heavy, coarse, luxuriant vegetation plentiful, and the country in many places low-lying and swampy. A climate, such as is described above, is eminently suitable for water-loving animals like buffaloes, where they live, thrive and multiply, and only appear to be thoroughly happy when they are wallowing up to their eyes in slush or lying in muddy pools with their

Buffaloes of Burma. (G. H. Evans.) AND BUFFALOES.

noses just out of water. The principal districts for them are Kyaukpyu, Sandoway, Bassein, Thongwa, Hanthawaddy, Pegu, Shwezigon, Amherst, Tavoy, and Mergui. To the cultivators of these parts buffaloes are invaluable, as their immense strength is required to plough the heavy, sticky soil, knee-deep in water. They can stand this work much better than cattle, as the feet of the latter are injured by such frequent wetting. However, they are unable to endure heat so well as oxen, and have to be unyoked during the hot part of the day. Sometimes they are employed to drag timber and bamboos from the jungle to the villages and creeks. Karens use them in draught, and they are sometimes used in oil-mills. In appearance these animals are clumsy and unwieldy, yet they are capable of wonderful activity. Their pace, when alarmed, is an awkward heavy gallop, carrying the head very high and the horns well back over the shoulders. These creatures rarely receive any hand-feeding or much attention and, as a rule, they are driven out to roam about the vast low-lying swampy plains where vegetation is abundant. Sometimes, however, when fodder is scarce, they are given an allowance of straw. As with cattle, owners send their buffaloes to grazing grounds under herdsmen till they are required. Fees are paid to the herdsman in the shape of a certain allowance of paddy per head, varying from three to five baskets, or the equivalent in money. Buffaloes, male and female, are put to work between the ages of three-half and four years. A great many pinky white specimens are to be seen in certain districts. They have a fairly good coat of light-coloured hair, and are in size about the same—sometimes larger than the black specimens. They are, however, not appreciated owing to the fact that they cannot stand heat. These animals usually have black feet and black eyes. Buffaloes are aged in accordance with the condition of their teeth.

Housing.—Usually in open pens, similar to those described for cattle.

Prices vary according to size, strength and age of animals; ordinary pairs run from Rs 150 to Rs 200, extra good ones up to Rs 250; female buffaloes are very little, if any, cheaper than males. Taking the Burmese buffaloes, as a whole, they are much finer looking animals than any I have met with in India.

DISEASES AND THEIR TREATMENT.

The diseases from which cattle suffer in this province, though few in number, are pretty deadly, annually claim thousands of victims, and must continue to do so until such time as legislative measures are adopted to cope with them. The diseases most prevalent are rinderpest, foot-and-mouth disease, and anthrax.

Rinderpest, Burmese "Kyaukpauk."—This terrible scourge is always present to a greater or less extent in different parts of the province. Thousands of cattle perish from it, and many of those that recover from the disease are rendered useless. This disease also prevails in the Shan States, fairly decimating the herds.

Foot-and-mouth disease, "sha-na kwa-na," is an annual plague, and, though the mortality is small from it, the inconvenience and loss to owners is sometimes great, as now and again so many cattle are affected at the same time that ploughing operations, etc., are at a stand still for want of working oxen.

Anthrax (*Doung-than* or *Gait-na*)—Though a very fatal disease does not prevail to anything like the extent that is popularly supposed, and though it no doubt carries off a great number of animals, yet the mortality from this cause sinks into insignificance when compared with that resulting from rinderpest.

Burmese buffaloes.

Diseases of cattle.
Die. Peon.
Prod.
0, 590.
Rinderpest.

Foot-and-mouth disease.

Anthrax.

OXEN**The Cattle and****Dysentery.**

Dysentery (Thwe-thun wun kya).—About the beginning of the rains, when rank succulent forage is abundant, cattle suffer very much from diarrhoea, and very frequently from a malignant and fatal form of dysentery.

Tuberculosis.

Tuberculosis (gyeik) is by no means a rare disease among oxen and buffaloes. The hot weather usually checks the progress of rinderpest, etc., yet it always lurks in places till a favourable season comes round for its propagation.

Various other forms of milder complaints occur but have no particular significance, so need not be mentioned in this note.

Burmese medicined and the methods employed by owners in the treatment of their cattle—

Rinderpest.—Burmese (*Kyauk-pauk*).

Karen (Lè-sah).

Shan (Auk-mat).

Immediately this disease is recognized, a draught is administered to each of the affected animals; it is usually composed of the following ingredients:—

	oz.
Arrack	about 1
Strong solution of nutmeg	1
Black caraway	1
Salt	1
Eggs	1
Sesamum oil	1

This is mixed into a paste, and given with about 12 oz. of water twice daily.

Black Caraway	Fennel flower.
(Nigella sativa)	a kind of pepper.
or powdered nutmeg	1 fruit.
Cocoanut milk	from 1 fruit.

This is mixed and given twice a day.

The idea in giving these is to cause the system to throw off the poison in the form of eruptions on the body. The people have also learned that it is in cases where the eruption is well-marked that the disease is more likely to take a favourable course.

Should a laxative be considered necessary, the following mixture is given:—

Tamarind fruit	5 tickals.
Garlic	10 "
Salt	5 "
Jaggery	10 "
Water	10 to 12 oz.

In cases where there is much purging, a strong decoction is prepared from the barks of the mango and cutch trees, and about ten tickals weight given as a dose.

Cutch is juice from the *Acacia Catechu* opium either in the solid form (when 4 annas weight, about 40 grains is given) or in solution mixed with arrack are employed for the same purpose.

1½ tickals = 1 chittack, Indian weight.

The shell of a hen's egg is frequently employed as a measure for drugs.

O. 55I—94.

Buffaloes of Burma. (G. H. Evans.) AND BUFFALOES.

<i>Foot-and-mouth disease</i> .—Burmese (<i>Kwā nā shā nā</i>).	Treatment of cattle diseases.
Karen (<i>Plái sāh, khaw sāh</i>). Shan (<i>Lint sit, Tint kyit sit</i>).	

In this disease, when the mouth is chiefly affected, it is a common custom to apply a small quantity of a mixture of powdered capsicum and salt over the tongue and dental pad. For the feet a decoction is made from the barks of the mango, guava, and of the jujuba tree (*Zizyphus Jujuba*) and applied as a lotion; camphor, or tar combined with sweet oil, are also employed as a dressing.

When there is an outbreak of disease in the hot weather, the animals are made to walk on hot sand. Deaths occur from this disease on the distant grazing grounds, where it is difficult to look after the animals.

Anthrax.—Burmese (*Gyaik, Daung-than*).

Karen (<i>Khli sāh</i>). Shan (<i>Láu-káu-an-lan sit</i>).

For any swellings that may occur a liniment is prepared by mixing soot, turmeric, sesamum oil in equal parts; this is smeared over the affected parts.

The following is employed as a purgative drench—ten to fifteen *tickals* of the juice and powdered leaves of the mudar plant (*Calotropis gigantea*); salt, a sufficiency, water about ten *tickals*, as a dose from 8 ozs. to 10 ozs. is given at a time. When a diuretic is considered necessary, an infusion or decoction is made with the Nepaul spinach (*Amaranthus gangeticus*) of the spinous amaranthus (*Amarantus spinosus*) combined with infusion from a plant known in Burma as “*Kala myelsi*” (lit. foreigner's eye); to this is added about two *tickals* of salt.

As further treatment, salt is sprinkled over the back and loins, over which a light cloth is thrown; the back is then thoroughly kneaded with hands and feet.

Hoven—*Wun-byei-Wun Yong* (Burmese).—These cases are simply treated by giving a laxative composed of salt, ginger, tamarind, treacle, garlic and water.

Catarrh—*Hná-se* (Burmese).—This condition is treated by blowing into the nostrils a small quantity of snuff mixed with salt.

General debility.—The following is employed in the treatment of this complaint:—pieces of pumpkin, oil-cake, salt, few ounces, are all put in an earthen jar and covered with a quantity of cold water; this is allowed to stand for some little time, after which about 10 *tickals* weight is given twice daily.

Dysentery and Diarrhoea are treated with opium or astringent decoctions.

Worms—Burmese, *Than*.—For the removal of internal parasites, the powdered root of the *Amomum corynostachyum*, with the powdered fruit of the *Phyllanthus Emblica*, mixed with little salt, is given with a pint of water. Betel-nut in two-*tickal* doses is used for the same purpose.

Mange—Burmese, *We*.—The affected parts are dressed with earth oil or plain cow-dung.

Choking—Burmese, *Asahnin*.—The treatment for choking, as described to me, is a novel one, and very easy to apply. It consists in hanging on to and jerking the tail until such time as the affected animal sees fit to either eject or swallow the obstructing agent. I have not had an opportunity of observing the efficacy of this mode of treatment.

OXEN**The Cattle and**

Treatment of cattle diseases.

Carrion eaten in Burma.

List of drugs used in cattle diseases.

Maggots—Burmese, *Lout*.—For destroying maggots in wounds, etc., powdered tobacco leaf and *chunam* in equal parts are applied.

It is a general custom in this country that no matter what disease an animal may be suffering from, to begin the treatment by applying medicines to the eyes; this usually consists of a mixture of ginger, capsicum, salt and jaggery, which is made into a paste, a small quantity of which is applied to the eyes. Cartmen sometimes apply this mixture to the eyes of their animals after a long and fatiguing march.

Disposal of carcasses.—Though the people of this country are not by their religion permitted to take life, they are, however, not in the least averse to consuming the flesh of animals that have succumbed to natural causes—in fact the majority of carcasses of animals that have died of disease are stripped of their flesh, which is eaten at once or is smoked and dried for future consumption. When the mortality is great, as is the case in severe epizootics, the carcasses not required for food are thrown out into the open fields or nullas, and are left for vultures and wild animals, which in a short time leave nothing but the skeletons. Though no statistics are to hand in this country regarding the evil effects of eating diseased flesh, it may reasonably be inferred that many of the cases of blood poisoning and choleric diarrhoea that occur may be ascribed to this cause.

Short List of Drugs employed in Burma in the Treatment of Cattle Diseases.

Vernacular names.	Botanical names.	Uses.
<i>May-o</i> . . .	<i>Calotropis gigantea</i> .	Externally vesicant, used in certain skin affections, and applied to anthracoid swellings. Internally given with salt as a purgative in Anthrax.
<i>Shah</i> . . .	<i>Acacia Catechu</i> , <i>Catechu</i> .	Astringent; either an infusion of the bark, or prepared cutch is given in Rinderpest and Diarrhoea.
<i>Kun</i> . . .	<i>Areca Catechu</i> .	Astringent, and anthelmintic.
<i>Bain</i> . . .	<i>Papaver somniferum</i> .	Astringent, sedative, and narcotic, given in Rinderpest and bowel complaints.
<i>Pa-daing-hatta</i> .	<i>Datura fastuosa</i> , var. <i>alba</i> .	Powerful narcotic, the leaves are given mixed with sulphate of iron in Hydrophobia.
<i>Hsay</i> . . .	<i>Nicotiana Tabacum</i> .	The powdered leaves are blown into the nostrils in cases of Rinderpest and Indigestion.
<i>Oh-shet-thi</i> . .	<i>Aegle Marmelos</i> , <i>Bael</i> .	An infusion from the rind of the fruit is given in fever, as an astringent in Dysentery.
<i>Nga-yoks-thi</i> . .	<i>Capsicum minimum</i> , Chillies.	Stomachic, the powdered fruit is also used in foot-and-mouth disease.
<i>Za-dai-kpo</i> . .	<i>Myristica fragrans</i> , Nutmeg tree.	Powdered fruit is given with spirits in Dysentery and Rinderpest.

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Short List of Drugs employed in Burma in the Treatment of Cattle Diseases—continued.			List of drugs used in cattle diseases.
Vernacular names.	Botanical names.	Uses.	
Sa-ba-lin . . .	<i>Andropogon</i> , <i>Schizanthus</i> , Lemon grass.	Infusion is used as a wash for sore eyes.	
Ma-gyi . . .	<i>Tamarindus indica</i> .	The fruit is used as a laxative.	
Min-goot . . .	<i>Garcinia Mangostana</i> , Mango-steen.	Astringent, an infusion of the rind is given in colic.	
Kyouk-pay-one . . .	<i>Benincasa cerifera</i> , White Gourd.	Tonic, given in Debility and Indigestion.	
Shain-koh . . .	<i>Ferula Narthex</i> , imported.	Externally it is applied to sores, internally it is given in Chest affections and also in Hives.	
Ka-det . . .	<i>Crataeva religiosa</i> , Three-leaved Caper.	Externally, the powdered leaves are mixed with salt and applied to inflamed surfaces, etc.	
Chu-si . . .	<i>Coccus nucifera</i> .	Cocoanut oil is used as a dressing for sores.	
Thin-baw-thi . . .	<i>Carica Papaya</i> .	Externally, the juice is used as a vesicant.	
Samon-net . . .	<i>Nigella sativa</i> .	Given with other drugs in Rinderpest.	
Ngu-gyee . . .	<i>Cassia Fistula</i> , Sweet-fruited Cassia.	An infusion made from the leaves and pulp is given as a purgative and is said to possess powerful properties.	
Wah-net . . .	<i>Bambusa nana</i> .	The leaves of the Black Bamboo are given as a diuretic.	
Thay-et . . .	<i>Mangifera indica</i> , Mango tree.	The powdered bark mixed with nutmeg and lime water is given in Rinderpest.	
Swon-ha-lowm . . .	<i>Phoenix dactylifera</i> , Date palm.	Astringent. The seeds are rubbed down with water and is given in Rinderpest.	
Ma-la-ka . . .	<i>Psidium Guyava</i> , White Guava.	An infusion of the bark is used as a lotion in Foot-and-mouth disease.	
Zi . . .	<i>Zizyphus</i> , Jujuba, Brier tree of India.	Uses same as that of the White Guava.	
Zi-byu . . .	<i>Phyllanthus Emblica</i> .	The powdered fruit mixed with salt is used in Rinderpest.	
Moke . . .	<i>Aloes</i> . . .	Given as a purgative, also used in small doses in foot-and-mouth disease.	
Kah-boung . . .	<i>Strychnos Nux-vomica</i> .	An infusion from the roots and pulp of fruit is employed as a lotion in Foot-and-mouth disease.	

**OXEN
AND BUFFALOES.**

The Cattle and Buffaloes of Burma.

List of drugs
used in cattle
diseases.

Short List of Drugs employed in Burma in the Treatment of Cattle Diseases—concluded.

Vernacular names.	Botanical names.	Uses.
<i>Hin-ka-nwe</i> . . .	<i>Amarantus gangeticus</i> , <i>Amarantus spinosus</i> .	Diuretic, given in cases of retention of urine.
<i>Hti-ga-yon su-bouk</i> .	<i>Mimosa pudica</i> .	Used as a diuretic and cooling medicine.
<i>Nga-yoke-kaung</i> .	<i>Piper nigrum</i> .	Carminative, given in Hoven.
<i>Sa-nawin</i> . . .	<i>Curcuma longa</i> .	Externally it is rubbed down and mixed with Sesamum oil, and is applied to wounds and inflamed surfaces.
<i>Pa-yoke</i> . . .	Camphor, imported	The powder is used in foot-and-mouth disease.
<i>Thet-yui-ni</i> . . .	<i>Croton oblongifolius</i> , <i>Ava</i> or Wild Croton.	The roots are purgative, and the leaves are used with fomentations in Rheumatism. Seeds and Bark also purgative.
<i>Men-ai</i> . . .	<i>Indigofera tinctoria</i> , Indigo,	An infusion of the plant is applied to anthracoid swellings.
<i>Shaak</i> . . .	<i>Citrus Bergamia</i> , Large lime tree.	The juice of this fruit mixed with honey is given as a laxative.

Grasses used
as fodder.

Grasses, etc., etc.

Vernacular names.	Botanical names.	Uses.
<i>Pyoung-byu</i> . . .	<i>Zea Mays</i> .	
	Maize or Indian Corn.	{ In the dry zone, the stalk and leaves of both these plants are used for fodder.
<i>Pyoung</i> . . .	<i>Sorghum vulgare</i>	
	Great millet.	
<i>Kauk-pin</i> . . .	<i>Oryza sativa</i> .	Rice straw is much used for feeding cattle.
<i>Kyan kyan-mai</i> .	<i>Saccharum officinarum</i> ,	The tender leaves of the black and white sugar-cane are used for feeding.
<i>Thek-kay-gyi</i> .	Sugar-cane.	
<i>La-man-myit</i> .	<i>Saccharum spontaneum</i> .	{ The Burmese recognise three varieties of this grass which is very plentiful in the Province, and when young is much liked by cattle. Kaing is said to be the best.
<i>Kaing</i> . . .		
<i>Mea-sa</i> . . .	<i>Cynodon Dactylon</i>	Plentiful in most parts of the Province.
<i>Wet-la</i> . . .	<i>Cyperus tegetum</i>	{ Both these sedges are much sought after by Buffaloes.
<i>Wet-myet-sa</i> . . .	<i>Cyperus sp. ?</i>	

All communications regarding THE AGRICULTURAL LEDGER should be addressed to the Editor, Dr. George Watt, Reporter on Economic Products to the Government of India, Calcutta.

The objects of this publication (as already stated) are to gradually develop and perfect our knowledge of Indian Agricultural and Economic questions. Contributions or corrections and additions will therefore be most welcome.

In order to preserve a necessary relation to the various Departments of Government, contributions will be classified and numbered under certain series. Thus, for example, papers on Veterinary subjects will be registered under the Veterinary Series; those on Forestry in the Forest Series. Papers of more direct agricultural or industrial interest will be grouped according as the products dealt with belong to the Vegetable or Animal Kingdom. In a like manner, contributions on Mineral and Metallic subjects will be registered under the Mineral Series.

This sheet and the title-page may be removed when the subject-matter is filed in its proper place, according to the letter and number shown at the bottom of each page.

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THE NAGPORE EXPERIMENTAL FARM.

Note by DR. J. W. LEATHER, Agricultural Chemist to the Government of India.

Other PAPERS that may be consulted :

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